ABSTRACT BOOK ABSTRACTS



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GLOBAL SKIN HEALTH

NOVEL POINT OF CARE DIAGNOSTIC STRATEGIES FOR SKIN DISEASE IN LOW RESOURCE SETTINGS: PORTABLE CONFOCAL MICROSCOPY FOR KAPOSI'S SARCOMA

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BACKGROUND: In resource-poor settings, challenges in obtaining traditional dermatopathology contribute to diagnostic delay of skin conditions, including cancers. We developed a low-cost smartphone portable confocal microscope with the aim of visualizing cellular details of the skin at point of care, and assessed its feasibility for use among patients with suspected Kaposi's sarcoma (KS) at the infectious Diseases Institute Uganda.

METHODS: We developed a low-cost smartphone confocal microscope by using a stationary confocal line-scanning optics, replacing the laser with an inexpensive LED, and utilizing the smartphone as the camera and data management tool. At an HIV care center, among HIV-infected patients with suspected KS referred for a biopsy, we performed both in vivo (intact skin) and ex vivo imaging (biopsied skin) to evaluate cellular features in the epidermis and dermis.

RESULTS: Both in vivo and ex vivo images were captured on 130 patients. Imaging took <15 minutes to complete. The device cost 10-20 times less than a standard confocal microscope. In vivo confocal images visualized characteristic cellular features of the skin, including keratinocytes, melanocytes, and dermal papillae. However, the best quality images were limited to the epidermis and the dermoepidermal junction due to light









A new ERA for global Dermatology 10 - 15 JUNE 2019 MILAN, ITALY

scattering in darker skin tones and reduced optical sectioning capability due to slit aperture. Ex vivo imaging, in contrast, successfully visualized cellular details in the epidermis and dermis (including collagen and adipocytes), as well as hypertrophic collagen and irregularlyshaped and sized capillaries.

CONCLUSIONS: We developed a low cost portable confocal microscope for use in resource-limited settings, which was able to detect cellular features of skin similar to those from traditional dermatopathology. Portable confocal microscopy should be further evaluated as a potential tool for point-of-care KS diagnosis. This study highlights the feasibility of developing low-cost point of care diagnostic tools for skin disease in resource poor settings.



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